

## Original Article

## Adherence of French cardiologists to guidelines for non-cardiac surgery



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## ABSTRACT

**Introduction:** In order to evaluate whether cardiologists follow guidelines, we studied patients who were seen for a preoperative cardiologic consultation prior to surgery.

**Methods:** This retrospective study took place in two surgical units (Vascular and Orthopaedic) in two different university hospitals in 2013. The patient eligibility criteria were: planned elective surgery, cardiologic consultation prior to anaesthesiology consultation and lack of any unstable cardiac condition. The primary endpoint was determination of appropriate use of preoperative cardiac stress exams (CSE).

**Results:** The study included 238 patients who were seen by 131 different cardiologists. Of 238 patients, 60 had a CSE before surgery, but only 7/60 (12%) were deemed to be necessary. Seven out 15 (47%) patients with an indication for a CSE actually underwent said exam. Sixty-six percent of patients (156/238) had a resting trans-thoracic echocardiography before surgery, while only 27/156 (17%) were considered of appropriate use. Among patients with known coronary arterial disease, 59/73 (81%) received a statin, 60/73 (82%) received an antiplatelet agent, and 38/73 (52%) received a beta-blocker. Among patients with planned arterial surgery, 86/137 (63%) received a statin and 100/137 (73%) patients received an antiplatelet agent. Of the 159 consultation reports that were examined, only 5 (3%) mentioned the Lee score and 117 (74%) were concluded with "no contraindication" or a similar phrase.

**Discussion:** In this study, we found that guidelines were generally not used when cardiologists evaluated patients for non-cardiac surgery. This is evidenced by the number of inappropriate exams performed, the lack of true perioperative risk stratification, and incomplete optimization of long-term treatment regimens.

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## 1. Introduction

A standardised evaluation of perioperative cardiovascular risk would identify those patients with the highest likelihood of cardiac complications. Such a strategy would allow patients to benefit from appropriate diagnostic and therapeutic modalities with the goal of reducing perioperative cardiovascular morbidity and mortality, without performing unnecessary exams. These strategies are available and regularly updated in international guidelines

[1–4]. French guidelines, better adapted to the French medical system, have been jointly written by the French Cardiology and French Anaesthesiology Societies in 2011 [5]. However, adherence of perioperative physicians (including anaesthesiologists) to these guidelines seems poor. This is especially demonstrated by examining the appropriateness of exams ordered for the detection and quantification of coronary arterial disease [6–11].

While often requested in the preoperative period for the evaluation of perioperative cardiovascular risk, only one study tried to evaluate cardiologist adherence to these guidelines. Based on the North-American guidelines published in 2007, a survey was published on how North-American interventional cardiologists managed patients with coronary stents undergoing non-cardiac

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surgery [4,12]. The results were in line with guidelines concerning the type of coronary stent to use and the optimal delay before proceeding with non-cardiac surgery. On the other hand, the use of cardiac stress exams (CSE) and the perioperative management of platelet aggregation inhibiting drugs were less appropriate. However, interpretation of the latter results may be biased because of low participation (only 10% of cardiologists answered the survey).

In order to study French cardiologist adherence to current guidelines, especially the appropriate use of CSE, independently of the influence of anaesthesiologists, we decided to study a group of patients seen by a cardiologist for elective surgery prior to the anaesthesiology consultation.

## 2. Patients and methods

This was a retrospective study involving a cohort of French cardiologists who performed consultations for patients with planned elective, non-cardiac surgery. All patients were seen by a cardiologist prior to their consultation with an anaesthesiologist. On most occasions, the surgeon ordered the cardiologic consultation.

No ethics committee was contacted.

Patients were sampled from two different French university hospitals: the Vascular Surgery Unit at the Pontchaillou Hospital, Rennes, from January to December 2013 and the Orthopaedic Surgery Unit at the Lyon-Sud Hospital, Pierre-Benite, Hospices Civils de Lyon, from August to October 2013.

All patients with planned elective surgery who had a cardiologic consultation before an anaesthesiology consultation were included in this study. Patients were excluded if they had an unstable cardiac condition (defined as: unstable angina pectoris, acute heart failure, significant cardiac arrhythmias, symptomatic valvular heart disease, or myocardial infarction within the past 30 days [5]). The primary endpoint was the appropriateness of the CSE ordered by the cardiologist and whether or not such exams were consistent with French guidelines [5].

A CSE was considered of appropriate use if:

- delaying surgery was possible;
- the result would change therapeutic strategies;
- the functional capacity of the patient was less than 4 metabolic equivalents of task (METs);
- and the Revised Cardiac Index Risk (RCRI) score was 2 or more in the setting of a high-risk surgery (such as abdominal aortic surgeries or distal arterial bypass) or 3 or more in the setting of an intermediate risk surgery [5].

Secondary endpoints were:

- the appropriateness of the resting trans-thoracic echocardiography (TTE) ordered by cardiologists as defined in both North-American and French guidelines;
- the adequacy of chronic medication regimens;
- the perioperative cardiac risk evaluation defined by the cardiologist;
- and the clinically relevant implications of the cardiologic consultation on perioperative management [5,13].

The majority of the data were collected from the anaesthesiology consultation report (RCRI score, clinical evaluation of functional capacity, surgical risk, medication lists, CSE, and TTE testing). The only data extracted from the cardiologic consultation report are the two last secondary endpoints.

The results compiled were completely descriptive in nature. As such, no statistical analysis was necessary; only patient age is

shown, expressed by the mean and the standard deviation. All percentages were rounded to the nearest unit.

Patient and cardiologist data were anonymous.

## 3. Results

During the study period, 238 patients were included, seen by 131 different cardiologists: 137 vascular surgery patients and 101 orthopaedic surgery patients. A flow chart diagram for inclusions and associated patient characteristics and planned surgeries are summarized in Fig. 1 and Table 1, respectively.

Cardiologic consultation reports were immediately available for 159/238 patients (67%). Anaesthesiology consultation reports were available for all patients and contained all data of interest. Table 2 shows the criteria used to evaluate the appropriateness of CSEs.

Sixty CSEs were ordered by cardiologists. Fig. 2 shows the type of first-line CSE ordered by cardiologists. Among exercise electrocardiograms, 21/32 (65%) were not interpretable (no change in clinical or electrical status and the maximal cardiac rate obtained was less than 220-age).

Fig. 3 shows the appropriateness of the cardiac stress exams ordered by cardiologists. Seven of the 60 (12%) CSEs ordered by cardiologists were actually indicated as previously defined. Seven out of the 15 (47%) patients with an indication for a CSE before

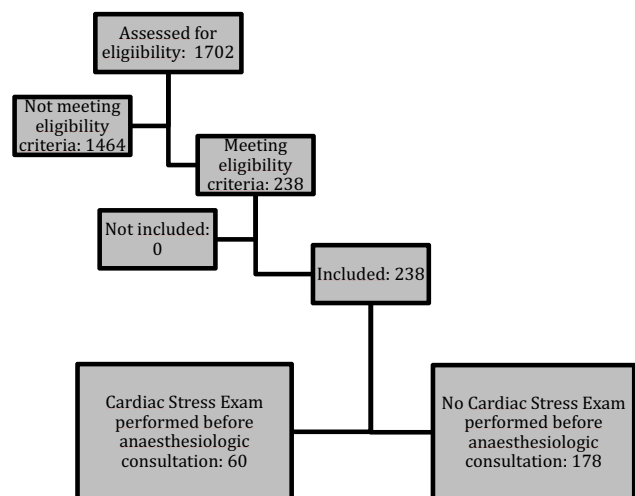


Fig. 1. Flow chart diagram.

Table 1

Characteristics of included patients and planned surgeries.

	Orthopaedic Surgery patients (n = 101)	Vascular Surgery patients (n = 137)
Age (years ± standard deviation)	71 ± 8	70 ± 11
Ratio men/women	0.91	4.95
ASA score		
1 or 2 (%)	59 (58)	104 (76)
3 or more (%)	42 (42)	33 (24)
Type of planned surgery		
Carotid endarterectomy (%)	–	34 (25)
Abdominal aortic surgery (%)	–	58 (42)
Distal artery surgery (%)	–	45 (33)
Total hip arthroplasty (%)	65 (64)	–
Total knee arthroplasty (%)	36 (36)	–

ASA: American Society of Anaesthesiologists.

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